

Lesson 3.3 | Reading a Diagram

Unit 3: Proof and Congruence • Student Notes

What Can Be Used Without Justification in a Proof

Source	What it gives you	Needs a given?
Given information	Anything stated explicitly in the problem	It IS the given
Postulates	Rules of the system — used freely but named	No — but name the postulate
Vertical angles	Congruent when two lines intersect	No
Linear pairs	Supplementary when two angles form a straight line	No
Reflexive / shared sides	A segment is congruent to itself	No
Parallel lines, bisectors, midpoints, perpendicularity, congruence marks	Cannot be assumed from appearance	Yes — must be given

How a Proof Chain Works

A proof is a chain of conditional statements connected by the law of syllogism.

Every statement needs a justification — unless it is from the free information list above.

The conclusion of one step becomes the antecedent of the next. In a flow chart proof, you can see this shape: the output of one box feeds into the input of the next.

When you need to justify a statement, ask: what earlier step (or combination of steps) allows me to conclude this?

CPCTC

CPCTC: Corresponding Parts of Congruent Triangles are Congruent.

Written as a biconditional:

If two triangles are congruent, then all six corresponding parts are congruent.

If all six corresponding parts of two triangles are congruent, then the triangles are congruent.

Course policy: Before writing CPCTC in any proof, board work, quiz, or assessment, you must first write its full meaning. The abbreviation is only permitted after the definition has been written.

CPCTC Practice — What follows from a congruence statement?

If $\triangle PQR \cong \triangle XYZ$, list all six congruence statements that CPCTC allows you to conclude:

Sides	Angles
_____ $\cong$ _____	_____ $\cong$ _____
_____ $\cong$ _____	_____ $\cong$ _____
_____ $\cong$ _____	_____ $\cong$ _____

Notation reminder: Order matters in a congruence statement.

$\triangle ABC \cong \triangle DEF$ means $A \leftrightarrow D$, $B \leftrightarrow E$, $C \leftrightarrow F$. The first letter of each triangle name corresponds to the first letter of the other, and so on. Writing $\triangle ABC \cong \triangle EDF$ makes a different claim about which parts correspond.

